

Abstract Submitted
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Studying the effect of antiarrhythmic drugs on rate-dependent behavior of human cardiac cells. BINAYA TULADHAR, HANA DOBROVOLNY, Texas Christian University — Sudden cardiac death from ventricular fibrillation is a major cause of death worldwide. Several different classes of antiarrhythmic drugs are currently available, each of which alters a different membrane ion conductance. While there are many studies examining the biomolecular effects of antiarrhythmic drugs and their clinical effect, their effect on cardiac dynamics at the cellular and tissue levels is not well understood. We use a mathematical model of a human ventricular cell to study the rate-dependent drug-effects of class I, III and IV antiarrhythmics to determine the drug-induced changes in action potential duration as a function of the cycle length. We study the bifurcation diagrams for cells in the presence of various concentrations of sodium blockers, potassium blockers and calcium blockers to study the appearance of alternans and the hysteresis.

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